

SWIFT FOX INVESTIGATIONS IN OKLAHOMA, 1999

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ABSTRACT

The swift fox (*Vulpes velox*) track search monitoring survey continued in two Oklahoma panhandle counties (Cimarron and Texas) and was initiated in four additional counties (Beaver, Harper, Ellis and Woodward), under a Section 6 project investigating swift fox distribution within the species' historical range. Swift fox were detected in 43 of 114 townships in the six county area. All 43 townships where swift fox tracks were successfully detected occurred in the panhandle region of Cimarron, Texas and Beaver counties.

INTRODUCTION

The swift fox (*Vulpes velox*) is classified as a furbearer species in Oklahoma with a year-round closed season with regard to take. The swift fox is also designated as a state species of special concern in Oklahoma. The swift fox has been documented to occur in the Panhandle region as well as in four counties in the northwestern corner of the main body of the state. Historic range and geographic distribution for the swift fox in Oklahoma is provided in Hoagland (1995) and Hoagland (1996).

During 1998 and 1999, Section 6 funds were available to conduct a swift fox population distribution survey in northwestern Oklahoma, by using a systematic track search survey. The objectives of this project were to: establish a track search survey to monitor population trends of swift foxes throughout the shortgrass High Plains ecoregion in Oklahoma; and develop a baseline database of swift fox distribution and abundance in northwestern Oklahoma. The track survey also allowed the populations of all terrestrial furbearer species to be monitored in the region. Data collection was initiated in August 1998 and is scheduled to be completed in September 2000. The project is being conducted by the Oklahoma Department of Wildlife Conservation (ODWC).

METHODS

Six ODWC personnel, four county game wardens and two wildlife biologists, conducted the track search surveys. All ODWC personnel were knowledgeable in reading furbearer tracks and with the area and local wildlife to be surveyed. The study area was defined as the shortgrass High Plains ecoregion that occurred within the historical swift fox range in Cimarron, Texas, Beaver, Harper, Ellis and Woodward counties. Every other township in the identified study area

was surveyed for furbearer tracks. Survey sites within each township were carefully selected, based on areas with the highest probability of finding swift fox tracks if swift foxes were present. Thus, survey locations focused on areas with herbaceous range habitat, flat terrain, the best available substrate for tracks, little vehicle traffic, and a lack of human disturbance. The same tracking sites were used each year unless major changes occurred that required new sites to be selected.

All track surveys were conducted during the months of August and September, during 1998 and 1999. Fifty-seven townships were identified to be surveyed for swift fox tracks during 1998 while 114 townships were targeted for track searches during 1999. Track searches were conducted with a minimum search time per township of 30 minutes and a maximum of 2 hours. Once a swift fox track was found, the time of search was recorded. The tracker continued searching if the track was found during the first 30 minutes of the search period, or moved on to the next township, after the initial 30 minutes. Since survey success was affected by time of day and weather conditions, track searches were conducted when possible during morning hours and 24 hours following a rainfall event, when possible.

For the purpose of selecting track search locations, broad habitat categories were delineated within the study area by using ArcView GIS 3.0, based on United States Geological Survey (USGS) land use and land cover data at 1:250,000 (USGS 1990). Classification codes used in data analysis included urban/industrial, cropland, including Conservation Reserve Program grasses (CRP), herbaceous rangeland, shrub rangeland, mixed rangeland, deciduous forest, evergreen forest, and water/wetlands. Habitat categories were ground verified for the townships surveyed. The habitat type recorded where swift fox and other furbearer tracks were located was recorded as range, CRP, fallow, winter wheat, irrigated crop (e.g. corn), other crop (e.g. milo, soybeans), and juniper mesa.

RESULTS

During 1999, all 114 townships in the targeted study area were successfully searched for swift fox tracks. The total cost for surveying the 19,349.05 km² area was \$9,802.34, which averaged \$86.00 per township. Trackers drove an average of 37 miles per township and averaged 8 days to complete the surveys. Swift fox tracks were detected in 43 (37.7%) of the townships surveyed (Figure 1). For each township where swift foxes were successfully detected, it took an average of 46 minutes to detect the first track; range 0 to 103 minutes. Swift fox tracks were detected within the first 30 minutes in 14 of the 43 townships. In 32 townships, swift fox tracks were found within the first hour. Eleven townships found swift fox tracks during the second hour of tracking. Forty townships had only one set of swift fox tracks observed during the initial 30 minutes; three townships had two sets of swift fox tracks detected within the initial 30 minute search interval.

In Cimarron and Texas counties, where data were available for both 1998 and 1999, the number of townships where swift fox tracks were detected declined 31.4%, from 35 townships to

24 townships (Table 1). The average time it took to detect swift fox tracks, if they were found, increased from 39 to 46 minutes, and the number of townships where swift fox tracks were observed within the first 30 minutes declined 70.6%, from 17 townships in 1998 to five townships in 1999 (Table 1). Swift fox tracks were not found more than one time within the first 30 minutes in any township during 1999, compared to seven townships where more than one set of swift fox tracks was observed in 1998 (Table 1).

During 1998, 42% of sites where swift fox tracks were observed in Cimarron and Texas counties had soil tracking conditions that were considered good to excellent, while in 1999, this percentage dropped to 34% (Table 2). The percentage of surveys conducted within one to three days following a rainfall event also dropped from 74% in 1998 to 51% in 1999, while the percentage of surveys conducted more than three days following a rainfall increased from 21% to 42% between 1998 and 1999 (Table 2). Likewise, the percentage of track search surveys conducted while winds were between one and five miles per hour decreased between years, from 68% to 44%, while the percentage of surveys conducted when wind speeds were greater than five miles per hour increased from 32% to 56% between 1998 and 1999 in the two county area (Table 2).

Table 1. Comparison of swift fox track detection statistics in Cimarron and Texas counties between 1998 and 1999.

Swift Fox Tracking Variables Recorded	1998	1999
Townships surveyed	57	57
Townships with swift fox tracks	35	24
Average time to first track in minutes	39	46
Townships with tracks observed within first 30 minutes	17	5
Townships with >1 set of swift fox tracks observed	7	0

Table 2. Soil tracking conditions, days since last rain, and wind conditions recorded during swift fox surveys in Cimarron and Texas counties during 1998 and 1999.

Environmental Conditions	1998	1999
Percentage of swift fox track sites with good to excellent tracking conditions	42%	34%
Percentage of surveys conducted within 1 to 3 days following a rain event	74%	51%
Percentage of surveys conducted greater than 3 days following a rain even.	21%	42%
Percentage of surveys conducted with winds 1 to 5 mph	68%	44%
Percentage of surveys conducted with winds > 5 mph	32%	56%

During 1999, swift fox tracks were detected on two-track and dirt roads in rangeland habitats 68% of the time, compared to 9% alongside or within fallow crop fields, 9% alongside or within winter wheat fields, 7% alongside CRP, 5% alongside or within other crop fields, and 2% alongside or within irrigated crop fields (Figure 2). Habitats searched in townships where swift fox tracks were not observed included 46% rangeland, 19% CRP, 13% fallow, 8% other crop, 7% winter wheat, 5% irrigated crop, and 1% juniper mesa. Cropland, including CRP lands, composed 51.2% of the entire study area. Rangeland comprised 49.1% of the study area, with 83.5% of the rangeland existing as herbaceous rangeland, 0.0002% as shrub rangeland, and 16.4% as mixed rangeland. In the panhandle region, cropland comprised 49.9% of the area and rangeland 48.4%; with the rangeland existing as 92.2% herbaceous range, 0.0003% shrub range, and 7.7% mixed rangeland. The rangeland plant community consisted primarily of blue grama (*Bouteloua gracilis*)-buffalograss (*Buchloe dactyloides*), interspersed with sandsage (*Artemisia filifolia*). The mixed rangeland also consisted predominately of blue grama and buffalograss, along with sandsage, yucca (*Yucca glauca*), and cholla cactus (*Opuntia imbricaria*). In the extreme eastern edge of the study area, eastern redcedar (*Juniperus virginiana*) encroachment was evident in the mixed range land use category.

Other furbearers detected with the survey during 1999 included, coyote (*Canis latrans*) in 99 townships (86.8%), badger (*Taxidea taxus*) in 42 townships (36.8%); raccoon (*Procyon lotor*) in 39 townships (34.2%), striped skunk (*Mephitis mephitis*) in 39 (34.2%) townships, bobcat (*Lynx rufus*) in 21 (18.4%) townships, domestic dog (*C. familiaris*) in 18 (15.8%) townships, and domestic cat (*Felis catus*) in 6 (5.3%) townships. Tracks of black-tailed jackrabbits (*Lepus californicus*) and eastern cottontail rabbits (*Sylvilagus floridanus*) were observed at 50 and 42 townships, respectively, and prairie dogs (*Cynomys ludovicianus*) were seen in 10 townships while surveying tracks. Information concerning jackrabbits, cottontails and prairie dogs, however, was only noted casually, and not specifically requested.

DISCUSSION

Results from track search surveys conducted for swift fox in Oklahoma indicate that this method has been an effective technique for conducting landscape-scale presence/absence surveys for swift fox. Because track searches were restricted to habitat believed most suitable for swift fox and most favorable for finding tracks, costs were controlled and high detection rates were achieved. Data quality was enhanced by using experienced ODWC employees as trackers. The use of county game wardens to conduct the survey aided tremendously in the ability to access private rangeland throughout the study area.

Swift fox tracks were encountered more often in herbaceous rangeland habitats than any other habitat type, however, herbaceous rangeland habitat was the habitat type searched whenever it was available within a survey township. Swift fox tracks were observed in agricultural areas throughout the study area, but agricultural areas were not searched in proportion to their availability. If cropland and rangeland were both present in a township, only the rangeland was most likely surveyed. The proportion of rangeland existing as herbaceous

rangeland in Panhandle was 92.2% while shrub and mixed range comprised 7.7%. Outside the Panhandle, the percentage of the existing rangeland that occurred as herbaceous range dropped to 57.0%, while the mixed herbaceous/shrub range increased to 42.9%. Because of the increasing vegetation density and height in the mixed herbaceous/shrub range, this habitat is not considered suitable for swift fox when compared to the relatively shorter, herbaceous rangeland vegetation that occurs in the shortgrass High Plains ecoregion.

In general, the terrain in the Panhandle portion of the study area was flatter than that of the main body of the state (Figure 3). From west to east across the study area, a greater proportion of the available herbaceous range occurred in rugged terrain where land conversion to cropland was not convenient. On the flatter terrain in the Panhandle portion of the study area, winter wheat was the predominant land use, while in the main body of the state, a greater proportion of the flatter terrain occurred as mixed range rather than as winter wheat. Thus, the amount of optimal swift fox habitat decreases from west to east through the shortgrass High Plains ecoregion within in Oklahoma.

Swift fox tracks were not observed using this survey outside the Panhandle region during 1999. Tracks were observed in one township in Harper County, but the two-hour time limit for the track search survey had already elapsed. A road kill swift fox was also recorded from Ellis County during the spring of 1999, prior to the when track search survey was conducted. Although this information indicates the presence of swift fox in the main body of the state, the extent to which the species occurs in the far eastern reaches of the shortgrass High Plains ecoregion is unknown.

The swift fox track detection rate decreased between 1998 and 1999 in the two counties for which data were available for both years (Cimarron and Texas counties). During the 1998 tracking season, this region received above normal rainfall, allowing 74% of the tracking surveys to be conducted within three days following a rainfall event. In contrast, only 51% of the track search surveys conducted during 1999 were done within three days after a rainfall. Conducting track searches following rainfall events resulted in better tracking conditions and may have resulted in more swift fox tracks being observed within these counties during 1998 than in 1999. The tracking substrate in Texas County, was particularly affected by precipitation patterns during the two years surveyed, and track detection rates dropped from 57% in 1998 to 37% in 1999.

LITERATURE CITED

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